

ABSTRACT OF THE DISCLOSURE

An apparatus and methods for determining *in situ* pore fluid and soil properties at a particular subsurface location are disclosed. In one embodiment, the apparatus comprises a penetrating tip member configured to penetrate soil. The apparatus further comprises an attachment module coupled to the penetrating tip member. The attachment module includes at least one mandrel that includes a piezo sensor. An *in situ* measurement of pore pressure is obtained by the piezo sensor at a depth that corresponds to the location of the at least one mandrel on the attachment module.